PATENT ABSTRACTS OF JAPAN

(11)Publication number :   07-200207

(43)Date of publication of application : 04.08.1995

| (51)Int.Cl. | G06F 3/12 |
| | B41J 5/30 |

| (21)Application number : 05-337447 | (71)Applicant : FUJI XEROX CO LTD |
| (22)Date of filing :   28.12.1993 | (72)Inventor : SUZUKI YASUNARI |

(54) PRINT SYSTEM AND PRINT MANAGEMENT DEVICE

(57)Abstract:
PURPOSE: To reduce the load on a print management device and to eliminate the execution of a complicated exception processing when a fault occurs in a printer.
CONSTITUTION: When a print request is received from a work station 14 in the print management device 18, it judges an objective printer (16A, 16B and 16C), transmits the print requests to the respective printers and registers the print request in a management table as a print waiting state. When the respective printers receive the print requests, they register them in print queues, take them out from the print queues when a system becomes a print possible state and inquire the propriety of the execution of a print processing as against the print request concerned. Since the processing as against the print request is not executed yet in the printer 16 which is inquired first, the print management device 18 transmits a print possible notice, and transmits a print impossible notice to the other printers. The printer 16A requests the transfer of print data to the work station 14 and executes the print processing by transferred print data.
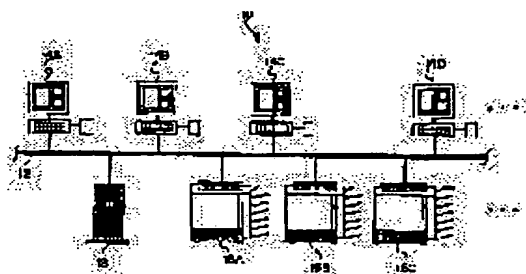
LEGAL STATUS

[Date of request for examination]   03.06.1999

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]   3106833

[Date of registration]   08.09.2000

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's

decision of rejection]
[Date of extinction of right]

CLAIMS

[Claim(s)]
[Claim 1] The print system containing printing management equipment characterized by providing the following A registration means to register this printing demand into a printing queue when a printing demand is received A reference means to take out a printing demand and to refer for the propriety of the execution of printing processing to the printing demand which took out from the aforementioned printing queue when a printer changes into the state which can be printed The printer of ****** preparation ****** A transmitting means to transmit this printing demand to the printer of the aforementioned predetermined number respectively when a printing demand is inputted to the group of the printer which consists of the printer of a predetermined number, When the aforementioned printing demand is inputted as a storage means, the aforementioned storage means is made to memorize by making printing processing to the aforementioned printing demand into a non-running state. When it refers for the propriety of the execution of printing processing to a predetermined printing demand from a predetermined printer It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means while transmitting the print data corresponding to the aforementioned printing demand to the aforementioned printer and making the printing processing to the aforementioned printing demand perform, when having not performed printing processing to the aforementioned predetermined printing demand. A printing execution-control means to forbid the execution of printing processing to the aforementioned printing demand by the aforementioned predetermined printer while the printing processing to the aforementioned predetermined printing demand is performing
[Claim 2] Two or more printers respectively equipped with a notice means to notify when a printer changes into the state which can be printed, A registration means to register with the printing queue in which this printing demand was respectively prepared corresponding to each printer when a printing demand is inputted as a storage means to the group of the printer which consists of the printer of a predetermined number, When the aforementioned printing demand is inputted, the aforementioned storage means is made to memorize by making printing processing to the aforementioned printing demand into a non-running state. When a predetermined printer changes into the state which can be printed, a printing demand is taken out from the printing queue corresponding to the aforementioned predetermined printer. When having not performed printing processing to the printing demand taken out the account of before, while transmitting the print data corresponding to the printing demand taken out the account of before to the aforementioned predetermined printer and making the printing processing to the aforementioned printing demand perform It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means. The print system containing printing management equipment equipped with a printing execution-control means to forbid the execution of printing processing to the aforementioned printing demand by the aforementioned predetermined printer while the printing processing to the printing demand taken out the account of before is performing.
[Claim 3] It is the print system according to claim 1 or 2 the aforementioned printing management equipment has further a storing means to store the print data corresponding to the aforementioned printing demand inputted with the aforementioned printing demand in the spool in which it was prepared by the aforementioned storage means, and carry out that the aforementioned printing execution-control means transmits to a printer the print data stored in the aforementioned spool as the feature.
[Claim 4] A registration means to register with the printing queue in which this printing demand was respectively prepared corresponding to each printer when a printing demand is inputted as a storage means to the group of the printer which consists of the printer of a predetermined number, When the aforementioned printing demand is inputted, the aforementioned storage means is made to memorize by

making printing processing to the aforementioned printing demand into a non-running state. When a predetermined printer changes into the state which can be printed, a printing demand is taken out from the printing queue corresponding to the aforementioned predetermined printer. When having not performed printing processing to the printing demand taken out the account of before, while transmitting the print data corresponding to the printing demand taken out the account of before to the aforementioned predetermined printer and making the printing processing to the aforementioned printing demand perform The printing management equipment contain a printing execution-control means forbid execution of the printing processing to the aforementioned printing demand by the aforementioned predetermined printer while the printing processing to the printing demand which changed while performing the state of printing processing over the aforementioned printing demand memorized by the storage means, and was taken out the account of before is performing.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]
[Industrial Application] this invention relates to a print system and printing management equipment, and relates to the print system equipped with the printing management equipment which manages the printing processing especially performed respectively by two or more printers and this printing management equipment, and two or more printers.

[0002]
[Description of the Prior Art] Now, the system which enabled it to share between information processing system various resources, such as a printer which decentralization of information or a load progressed, connected two or more workstations and personal computers of each other through the network, and was connected to the same network, is permeating widely. In such a system, in consideration of the throughput of a printer being comparatively small, two or more printers are formed in many cases, and in order that two or more workstations and personal computers may prevent requiring execution of printing simultaneously to a single printer, printing management equipment is formed in many cases.

[0003] In the print system and information processor which were shown in JP,4-245525,A in relation to the above, in the management server (printing management equipment) which manages a printing demand, the printer which calculates the time which the printing processing under execution takes by each printer, and serves as the shortest latency time is elected, and what is notified to the workstation of printing demand origin is proposed. Moreover, a printer is divided into two or more groups, and while making the group of a printer which makes it print on a user specify, a printer with the lightest load is chosen in the specified group, and it is made to make printing processing perform with the print management equipment shown in JP,3-255519,A.

[0004]
[Problem(s) to be Solved by the Invention] However, the spool which memorizes the print data for a printer performing printing processing above is respectively prepared in each printer, and it sets to the side which manages each printer. If it opts for making a predetermined printer perform printing processing to a predetermined printing demand, although it is made to transmit the print data corresponding to the aforementioned predetermined printing demand to a predetermined printer For example, when failure occurred to a printer in the middle of printing processing, complicated exception handling of retransmitting again the print data memorized by the spool of the broken printer to other printers needed to be performed.

[0005] Moreover, since each printer always needed to calculate the size of the load which has joined [whether it is under / execution / ******, and] each printer in printing processing etc. and needed to grasp it by the side which all manages a printer above, there was a problem that the load of the side which manages a printer was large. Furthermore, in the system equipped with the printer which formats print data per page at the time of a printing processing start, and performs printing processing at it, although print number of sheets needed to be detected from the print data registered into the spool of each printer in order to grasp the size of the load of a printer, it is difficult to detect print number of sheets, and it was not able to apply to the system actually equipped with the above printers until the format was performed.

[0006] When this invention is accomplished in consideration of the above-mentioned fact, and the load of printing management equipment is reduced and failure occurs to a printer, it is the purpose to obtain a print system without the need of making complicated exception handling performing.

[0007] Moreover, it is the purpose to obtain the printing management equipment which can perform printing processing to a printing demand for a short time, without performing complicated exception handling, when a load becomes excessive [this invention] or failure occurs to a printer.

[0008]
[Means for Solving the Problem] The print system applied to invention according to claim 1 in order to

attain the above-mentioned purpose A registration means to register this printing demand into a printing queue when a printing demand is received, A reference means to take out a printing demand and to refer for the propriety of the execution of printing processing to the printing demand which took out from the aforementioned printing queue when a printer changes into the state which can be printed, A transmitting means to transmit this printing demand to the printer of the aforementioned predetermined number respectively when a printing demand is inputted to the group of the printer which consists of the printer of ****** preparation ******, and the printer of a predetermined number, When the aforementioned printing demand is inputted as a storage means, the aforementioned storage means is made to memorize by making printing processing to the aforementioned printing demand into a non-running state. When it refers for the propriety of the execution of printing processing to a predetermined printing demand from a predetermined printer It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means while transmitting the print data corresponding to the aforementioned printing demand to the aforementioned printer and making the printing processing to the aforementioned printing demand perform, when having not performed printing processing to the aforementioned predetermined printing demand. While the printing processing to the aforementioned predetermined printing demand is performing, it constitutes including printing management equipment equipped with a printing execution-control means to forbid the execution of printing processing to the aforementioned printing demand by the aforementioned predetermined printer.

[0009] The print system concerning invention according to claim 2 Two or more printers respectively equipped with a notice means to notify when a printer changes into the state which can be printed, A registration means to register with the printing queue in which this printing demand was respectively prepared corresponding to each printer when a printing demand is inputted as a storage means to the group of the printer which consists of the printer of a predetermined number, When the aforementioned printing demand is inputted, the aforementioned storage means is made to memorize by making printing processing to the aforementioned printing demand into a non-running state. When a predetermined printer changes into the state which can be printed, a printing demand is taken out from the printing queue corresponding to the aforementioned predetermined printer. When having not performed printing processing to the printing demand taken out the account of before, while transmitting the print data corresponding to the printing demand taken out the account of before to the aforementioned predetermined printer and making the printing processing to the aforementioned printing demand perform It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means. While the printing processing to the printing demand taken out the account of before is performing, it constitutes including printing management equipment equipped with a printing execution-control means to forbid the execution of printing processing to the aforementioned printing demand by the aforementioned predetermined printer.

[0010] Moreover, in invention according to claim 1 or 2, printing management equipment can be further equipped with a storing means to store the print data corresponding to the printing demand inputted with the printing demand in the spool in which it was prepared by the storage means, and a printing execution-control means can be constituted so that the print data stored in the aforementioned spool may be transmitted to a printer.

[0011] A registration means to register the printing management equipment concerning invention according to claim 4 into the printing queue in which this printing demand was respectively prepared corresponding to each printer when a printing demand is inputted as a storage means to the group of the printer which consists of the printer of a predetermined number, When the aforementioned printing demand is inputted, the aforementioned storage means is made to memorize by making printing processing to the aforementioned printing demand into a non-running state. When a predetermined printer changes into the state which can be printed, a printing demand is taken out from the printing queue corresponding to the aforementioned predetermined printer. When having not performed printing processing to the printing demand taken out the account of before, while transmitting the print data corresponding to the printing demand taken out the account of before to the aforementioned predetermined printer and making the printing processing to the aforementioned printing demand perform It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means, and while the printing processing to the printing demand taken out the account of before is performing, execution of the printing processing to the aforementioned printing demand by the aforementioned predetermined printer is constituted including a printing execution-control means to forbid.

[0012]

[Function] In invention according to claim 1, when a printing demand is inputted to the group of the

printer which consists of the printer of a predetermined number, this printing demand is respectively transmitted to the printer of a predetermined number by the transmitting means. By each printer, if it ends and the printing processing which this printing demand was registered into the printing queue by the registration means when the printing demand was received, for example, was being performed will be in the state which can be printed, a printing demand will be taken out from a printing queue by the reference means, and it will refer for the propriety [processing / printing / to the taken-out printing demand] of execution. Therefore, it will refer for the propriety of the execution of printing processing to a certain printing demand sequentially from the printer which changed into the state among each printer which constitutes the aforementioned group which can be printed, and since it will not be in the state which can be printed about the printer which failure etc. generated, it does not refer for the propriety of execution of printing processing.

[0013] On the other hand, with the printing execution-control means of printing management equipment When a printing demand is inputted, a storage means is made to memorize by making printing processing to a printing demand into a non-running state. When it refers for the propriety of the execution of printing processing to a predetermined printing demand from a predetermined printer It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means while transmitting the print data corresponding to the aforementioned printing demand to the aforementioned printer and making printing processing perform, when having not performed printing processing to a predetermined printing demand. While the printing processing to a predetermined printing demand is performing, the execution of printing processing to the aforementioned printing demand by the predetermined printer is forbidden.

[0014] Thus, printing management equipment needs to grasp neither the state of each printer, nor the size of the load which has joined each printer according to an operation etc., and can make the printing processing to which the load was the lightest, namely, printing to the printing demand into which it was inputted by above-mentioned processing was carried out perform to the printer ended most early automatically. Therefore, while being able to make the printing processing to a printing demand perform for a short time, the load of printing management equipment is sharply mitigable.

[0015] Moreover, with a printing execution-control means, since print data are transmitted when referring for the propriety of the execution of printing processing to a predetermined printing demand from a predetermined printer and having not performed the aforementioned printing processing, printing management equipment does not need to perform like before, complicated exception handling of transmitting again the print data beforehand transmitted to this printer to other printers, when a printer breaks down. It is also possible to apply this invention to the system equipped with the printer by which it prints by formatting print data, for example at the time of a printing start since a printing execution-control means does not need to detect the print number of sheets to the inputted printing demand etc. and does not need to calculate the end time of the printing processing under execution etc. by each printer.

[0016] In invention according to claim 2, a notice means to notify when a printer changes into the state which can be printed is prepared in each printer, and a registration means to register a printing demand into a printing queue is prepared in printing management equipment. When a printing demand is inputted, a storage means is made to memorize the printing execution-control means of printing management equipment by making printing processing to the aforementioned printing demand into a non-running state. When a predetermined printer changes into the state which can be printed and is notified from a notice means A printing demand is taken out from the printing queue corresponding to a predetermined printer. It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means while transmitting the print data corresponding to the printing demand taken out to the predetermined printer and making printing processing perform, when having not performed printing processing to the taken-out printing demand. While the printing processing to the taken-out printing demand is performing, the execution of printing processing to the aforementioned printing demand by the predetermined printer is forbidden.

[0017] Therefore, printing management equipment needs to grasp neither the state of each printer, nor the size of the load which has joined each printer according to an operation etc., and can make the printing processing to which the load was the lightest, namely, printing to the printing demand into which it was inputted by above-mentioned processing was carried out perform to the printer ended most early automatically like invention according to claim 1. Therefore, while being able to make the printing processing to a printing demand perform for a short time, the load of printing management equipment is sharply mitigable. Moreover, it is also possible to apply to the system equipped with the printer which does not need to perform complicated exception handling when a printer breaks down, and prints by formatting print data at the time of a printing start.

[0018] In addition, you may make the print data prepared the storing means stored in the spool in which these print data were prepared by printing management equipment at the storage means when the print data corresponding to [although it could be made to carry out directly from the side to which the transfer of the print data to a printer outputted the printing demand, as it indicated also to the claim 3] this printing demand in a printing demand were inputted, and once stored to the spool transmit to a printer.

[0019] When a printing demand is inputted, while registering with the printing queue in which the aforementioned printing demand was respectively prepared by the registration means corresponding to each printer, the printing processing to the aforementioned printing demand is carried out as a non-running state by the printing execution-control means, and a storage means is made to memorize in invention according to claim 4. Moreover, when a predetermined printer changes into the state which can be printed, a printing management tool A printing demand is taken out from the printing queue corresponding to a predetermined printer. It changes, while performing the state of printing processing over the aforementioned printing demand memorized by the storage means while transmitting the print data corresponding to the printing demand taken out the account of before to the predetermined printer and making printing processing perform, when having not performed printing processing to the taken-out printing demand. While the printing processing to the taken-out printing demand is performing, the execution of printing processing to the aforementioned printing demand by the predetermined printer is forbidden.

[0020] Thereby, printing processing to a printing demand can be performed like invention of a claim 1 and a claim 2 for a short time, without performing complicated exception handling, when a load becomes excessive or failure occurs to a printer. Moreover, it is possible to apply to the print system using the printer of general composition of for invention of a claim 4 to perform printing processing, when print data are transmitted, and for printing processing to be completed, and to notify that it will be in the state which can be printed, even if it does not change the composition of a printer.

[0021]

[Example] Hereafter, with reference to a drawing, the example of this invention is explained in detail.

[0022] The [1st example] The print system 10 concerning **** 1 example is shown in drawing 1 . Printing management equipment 18 and ** are connected with two or more workstations 14A, 14B, and 14C and 14D·· with two or more sets of Printers 16A and 16B, and 16C··, and the print system 10 is constituted by the transmission medium 12. As shown in drawing 2 , printing management equipment 18 is equipped with CPU18A, ROM18B, RAM18C, and input/output port 18D, and these are mutually connected through bus 18E. Input/output port 18D is connected to the transmission medium 12 through communications control unit 18F.

[0023] The program for realizing the function as printing management equipment 18 is memorized by ROM18B. It will be read from ROM18B and this program will be performed, if the power supply of printing management equipment 18 is switched on. Moreover, Printers 16A and 16B and 16C·· are beforehand classified into two or more groups according to this example, as shown in the next table 1 as an example, and the group name is given to each.

[0024]

[Table 1]

グループ名	プリンタ名
KEIRI	A. B. C
SOUMU	E. D
KAIHATU	C. E
⋮	⋮

[0025] The group registration table to which the information which expresses the name of each group and all the printers belonging to each group to ROM18B as shown in Table 1 was made to correspond is memorized beforehand. In addition, a group division of a printer can be performed so that the printers and printing quality to which the installation is close may serve as a group with same near printers and printers with the same kind (for example, a laser beam printer, a dot impact printer, monochrome, a color, etc.) equally or equally, and as shown in Table 1, the single printer may belong to two or more groups.

[0026] Moreover, the printer 16 is constituted including the printer section 20 which performs actual printing processing, and the printer control section 22 which performs control of operation of the printer section 20 etc. The printer control section 22 is equipped with CPU22A, ROM22B, RAM22C, and input/output port 22D like the above-mentioned printing management equipment 22, and these are

mutually connected through bus 22E. Input/output port 22D is connected to the transmission medium 12 through communications control unit 22F.

[0027] By the way, in the print system 10, various kinds of directions, data, etc. which are transmitted and received through a transmission medium 12 are constituted, as shown in drawing 3 (A) (henceforth [these are named generically and] a message). That is, let the field of the head of a message be the field which stores the information showing the message-sending point. Moreover, the next field is made into the field which stores the message identification child for discriminating each message (for example, the printing demand mentioned later, printing propriety reference, etc.), and let the field following the field which stores a message identification child be the field which stores a description (information to express).

[0028] For example, when a message is a printing demand, as shown in drawing 3 (B), a description consists of the fields which store the information which specifies the group of the field which stores a print-data name, the field which stores the information showing message dispatch origin, the printer to which printing processing is made to perform, or a printer. Moreover, when messages are printing propriety reference, printing start directions, the notice of a printing end, the notice that can be printed, a printing improper notice, etc., as shown in drawing 3 (C), the description consists of only the field which stores a print-data name, and the field which stores the information showing message dispatch origin.

[0029] Next, an operation of **** 1 example is explained with reference to the flow chart of drawing 4 and drawing 5 . The processing first performed with printing management equipment 18 with reference to the flow chart of drawing 4 is explained. At Step 100, it judges whether a certain message was received. If a message is received, the judgment of Step 100 will be affirmed and it will shift to Step 102. At Step 102, it judges whether the message which received is the printing demand from a workstation 14 with reference to the information stored in the field of the message identification child of a message who received. When the judgment of Step 102 is affirmed, it shifts to Step 104.

[0030] At Step 104, the printer 16 as an object which transmits a printing demand is determined with reference to the information stored in the data output point field in the printing demand which received. At this example, it can choose now whether printing processing is made to perform to a specific printer, or printing processing is made to perform for any of two or more printers belonging to a certain group being by the workstation 14 side. When making it print to a specific printer, the information showing a specific printer is stored in the field of the data output point of the message of a printing demand. In this case, let the specified this specific printer be a printer for printing demand transmission. Moreover, when making printing processing perform for any of two or more printers which constitute a certain group being, the information showing the name of the group which is in the field of the data output point of the message of a printing demand the account of before is stored. In this case, let all the printers belonging to the specified group be the printers for printing demand transmission with reference to the above-mentioned group registration table.

[0031] At Step 106, a printing demand is transmitted to all the printers determined as a candidate for printing demand transmitting at Step 104. At the following step 108, the state of printing processing over a printing demand is registered into the printing managed table beforehand prepared on memory as a printing waiting state, and it returns to Step 100. The printing managed table is considered as composition as shown in the next table 2 as an example.

[0032]
[Table 2]

印刷データ名	印刷先 （グループ／特定プリンタ）	状態	要求元 （ユーザ名）	
D A T A 1	K E I R I	印刷待ち	S U Z U K I	
D A T A 2	K A I H A T U	印刷中	S A T O	
⋮	⋮	⋮	⋮	

[0033] In addition, in Table 2, a "print-data name" expresses the name of the print data corresponding to a printing demand, and "the requiring agency" expresses the user name (name of the user who is using the workstation 16) which is demanding printing. On the other hand, when the judgment of Step 102 is affirmed, the message which received at Step 110 judges whether it is printing propriety reference. In addition, although the detail of this printing propriety reference is mentioned later, it is a message for referring for whether a predetermined printer may perform printing processing to a predetermined printing demand. When the judgment of Step 110 is affirmed, it shifts to Step 112. At Step 112, it judges whether the state of the predetermined printing demand for which it referred by printing propriety reference is in "the waiting state waiting for printing" with reference to a printing managed table.

[0034] Since the predetermined printing demand by which reference was carried out [aforementioned] is a printing demand to which printing is performed by neither of the printers when the judgment of Step 112 is affirmed, the notice express permitting printing to this predetermined printing demand and which can be printed is transmitted to the printer which transmitted printing propriety reference at Step 114. At the following step 116, the state of a printing demand of corresponding on a printing managed table is changed "during printing", and it returns to Step 100. Moreover, since the state of the aforementioned predetermined printing demand registered into the printing managed table "is printing" when processing of Steps 114 and 116 has already been performed to the predetermined printing demand for which it referred by printing propriety reference, the judgment of Step 112 is denied. In this case, it shifts to Step 118, the printing improper notice showing forbidding printing to a predetermined printing demand is transmitted to the printer which transmitted printing propriety reference, and it returns to Step 100.

[0035] On the other hand, when the judgment of Step 110 is also denied, it judges whether the message which received at Step 120 is the notice of a printing end. When the judgment of Step 120 is affirmed, the state of the predetermined printing demand on a printing managed table is changed into "a printing end" at Step 122, and it returns to Step 100. Moreover, it returns to Step 100, without processing in any way noting that the message which is not possible is received, when the judgment of Step 120 is also denied.

[0036] Next, the processing performed by the printer control section 22 of each printer 16 is explained with reference to the flow chart of drawing 5 . In addition, in the flow chart of drawing 5 , printing processing is performed at Step 144. When printing processing of this step 144 is not performed, it is judged that a printer 16 is in the state which can be printed. At Step 130, it judges whether a certain message was received. With reference to the information which shifts to Step 132 when the judgment of Step 130 is affirmed, and is stored in the field of the message identification child of a message who received, it judges whether the message which received is the notice from printing management equipment 18 which can be printed. When the judgment of Step 132 is denied, it judges whether the message which received at Step 136 is the printing demand from printing management equipment 18.

[0037] When the judgment of Step 136 is affirmed, it shifts to Step 137, and it judges whether there is any printing demand to which the printing queue beforehand formed on memory is already registered into it being empty, i.e., a printing queue. When the judgment of Step 137 is affirmed, the printing propriety reference message for referring for whether printing processing to the printing demand which received above in Step 139 may be performed is transmitted to printing management equipment 18, and it returns to Step 130. Moreover, when the judgment of Step 137 is denied, the printing demand which carried out [aforementioned] reception is registered into the last (tail) of a printing queue at Step 138, and it returns to Step 130.

[0038] When the notice which can be printed is received from printing management equipment 18, the judgment of the above-mentioned step 132 is affirmed, a data transfer demand is transmitted to a workstation 14 at Step 134, and it returns to Step 130. By this, print data will be transmitted to a printer 16 from the workstation 14 which transmitted the printing demand. When print data are received, the judgment of Steps 132 and 136 is denied and it judges whether the message which received at Step 140 is the printing improper notice from printing management equipment 18. In this case, the judgment of Step 140 is denied, it shifts to Step 142, and the message which received judges whether they are the print data transmitted from the workstation 14.

[0039] When print data are received, the judgment of Step 142 is affirmed, and printing processing is made to perform using the print data which the printer section 20 was operated at Step 144, and were transmitted from the workstation 14. An end of printing processing of Step 144 transmits the notice of a printing end showing printing processing having been completed to printing management equipment 18 at the following step 146. At the following step 148, ejection of the next printing demand is performed from a printing queue. At the following step 150, it judges whether a printing queue has a printing demand. It returns to Step 130, without denying the judgment of Step 150 and processing in any way, when the printing queue is not registered at all and empty, i.e., a printing demand, fails in the ejection of a printing demand at Step 148.

[0040] When the printing demand is registered into the printing queue, by succeeding in the ejection of a printing demand at Step 148, the judgment of Step 150 is affirmed and the printing propriety reference message about the printing demand taken out from the head of a printing queue at Step 152 is transmitted to printing management equipment 18. Moreover, when a printing improper notice is received from printing management equipment 18, the judgment of Step 140 is affirmed, and it shifts to Step 148, and processes by newly taking out a printing demand from a printing queue like the above. In addition, it returns to Step 130, without processing in any way noting that the message which is not possible is received, when the judgment of Step 142 is denied.

[0041] Next, the processing sequence of the print system 10 of **** 1 example performed while

communicating a message between the above-mentioned workstation 14, printing management equipment 18, and a printer 16 is further explained with reference to drawing 6 . If the printing demand from a workstation 14 is received, while judging the printer for printing demand transmission with printing management equipment 18 (it considers as Printers 16A, 16B, and 16C in drawing 6) and transmitting a printing demand to each printer, this printing demand is carried out as a printing waiting state, and it registers to a printing managed table. By each printer, if the printing demand from printing management equipment 18 is received, it will register with a printing queue respectively.

[0042] Next, if printer 16A will be in the state which can be printed, in printer 16A, the aforementioned printing demand will be taken out from a printing queue, and the printing propriety reference which refers for the propriety of the execution of printing processing to this printing demand will be transmitted to printing management equipment 18. In the sequence shown in drawing 6 , after that, Printers 16B and 16C will also be in the state which can be printed one by one, and printing propriety reference will be respectively transmitted to printing management equipment 18. With printing management equipment 18, since the state where it registered with the printing managed table is in the waiting state waiting for printing when printing propriety reference is first received from printer 16A, the notice which can be printed is transmitted to printer 16A, and while printing the state where it registered with the printing managed table, it changes. In printer 16A, if the notice which can be printed is received, a print-data transfer request will be transmitted to the workstation 14 of printing demand origin, and printing processing will be performed by the transmitted print data. Moreover, since the state where it registered with the printing managed table is printing when printing propriety reference is received from Printers 16B and 16C, a printing improper notice is transmitted respectively.

[0043] Thus, since print data are transmitted after receiving printing propriety collating from a printer 16 above, when a printer breaks down, it is not necessary to perform complicated exception handling of transmitting again the print data beforehand transmitted to this printer to other printers. Moreover, since the printing processing to the aforementioned predetermined printing demand is made to perform to the printer which transmitted the notice of printing propriety early most to the predetermined printing demand, even if it does not grasp the size of the load which has joined the printer of each [printing management equipment 18], printing processing can be made to perform to a printer with the lightest load automatically. Furthermore, since it is not necessary to detect print number of sheets etc. and to calculate the end time of printing processing etc. in order to calculate the size of the load which has joined the printer, it is also possible to use the printer which prints by formatting print data at the time of a printing start.

[0044] The [2nd example] The 2nd example of this invention is explained below. In addition, the same sign is given to the same portion as the 1st example, and explanation is omitted. As shown in drawing 7 , the printing management equipment 18 concerning **** 2 example is equipped with the storage 24 with comparatively large storage capacity. The spool for storing and accumulating print data so that it may mention later is prepared in the storage region of storage 24.

[0045] Next, an operation of **** 2 example is explained. First, an operation of printing management equipment 18 is explained with reference to the flow chart of drawing 8 . In addition, below, only a different portion from the flow chart of drawing 4 explained in the 1st example is explained. In the **** 2 example, as shown also in drawing 10 , print data are transmitted following a printing demand from a workstation 14. When a printing demand is received, the judgment of Step 102 is affirmed, it shifts to Step 103, and the print data which received following the printing demand are stored in the spool in which it was prepared by storage 24. Therefore, with printing management equipment 18, whenever it receives a printing demand, print data are stored in a spool, and it accumulates.

[0046] Moreover, when the printing demand corresponding to this printing propriety reference is in "the waiting state waiting for printing", printing propriety reference is received from a printer 16, print data are taken out from a spool at Step 113 (when the judgment of Step 112 is affirmed), in the following step 115, printing management equipment 18 to the aforementioned printing propriety reference is replaced with in the transmitted printer 16 to the notice of the 1st example which can be printed, and print data are transmitted.

[0047] Next, with reference to the flow chart of drawing 9 , an operation of the printer control section 22 of a printer 16 is explained. In the printer control section 22 of **** 2 example, the kinds of message which receives are a printing demand, a printing improper notice, and three kinds of print data, and the judgment of Step 132 whose message which received judges whether it is the notice which can be printed is omitted as compared with the flow chart of drawing 5 . Moreover, at Step 143, when it judges whether the messages which received are the print data from printing management equipment 18 and the judgment of Step 143 is affirmed, printing processing is performed like the 1st example henceforth [the following step 144].

[0048] Next, the processing sequence of the print system 10 of **** 2 example is further explained with reference to drawing 10 . If the printing demand from a workstation 14 is received, and print data are received continuously, while judging the printer for printing demand transmission with printing management equipment 18 and transmitting a printing demand to each printer, this printing demand is carried out as a printing waiting state, and it registers to a printing managed table. By each printer, if the printing demand from printing management equipment 18 is received, it will register with a printing queue respectively. In addition, the print data received with printing management equipment 18 are stored in a spool.

[0049] If printer 16A will be in the state which can be printed, in printer 16A, the aforementioned printing demand will be taken out from a printing queue, and the printing propriety reference which refers for the propriety of the execution of printing processing to this printing demand will be transmitted to printing management equipment 18. After that, Printers 16B and 16C will also be in the state which can be printed one by one, and printing propriety reference will be respectively transmitted to printing management equipment 18. With printing management equipment 18, since the state where it registered with the printing managed table is in the waiting state waiting for printing when printing propriety reference is first received from printer 16A, the print data stored in the spool are transmitted to printer 16A, and while printing the state where it registered with the printing managed table, it changes. Thereby by printer 16A, printing processing is performed by the transmitted print data. Moreover, since the state where it registered with the printing managed table is printing when printing propriety reference is received from Printers 16B and 16C, a printing improper notice is transmitted respectively.

[0050] Even if between a workstation 14 and printing management equipment 18 will be in a communication impossible state by a certain cause after a workstation's 14 transmitting a printing demand and print data to printing management equipment 18 since print data are stored in a spool above when printing management equipment 18 receives a printing demand, the printing processing to the aforementioned printing demand can be carried out normally, without receiving this influence.

[0051] The [3rd example] The 3rd example of this invention is explained below. In addition, since **** 3 example is the same composition as the 1st example, it attaches the same sign, omits explanation of composition, with it explains an operation of the 3rd example of Shimomoto. First, an operation of printing management equipment 18 is explained with reference to the flow chart of drawing 11 . In addition, below, only a different portion from the flow chart of drawing 4 explained in the previous example and drawing 8 is explained.

[0052] In the **** 3 example, as shown in printing management equipment 18 as an example in the next table 3, the printer state managed table for managing whether the state of each printer is "waiting" or it is "under printing" is prepared.

[0053]
[Table 3]

プリンタ名	状　態
A	待機中
B	待機中
C	印刷中
⋮	⋮

[0054] In addition, when [all] the state of each printer set as this printer state managed table supplies a power supply to the print system 10, initial setting of it is carried out to "it is waiting." Moreover, as for the printing management equipment 18 of **** 3 example, the printing queue of all printers is also formed.

[0055] Printing management equipment 18 compares the data output point with a group registration table at Step 104, when the message which received judges that it is the printing demand from a workstation (when the judgment of Step 102 is affirmed). After determining the printer 16 for [the printing processing to this printing demand may be made to perform] a printing demand It judges whether the "waiting" printer 16 has a state in all the printers 16 for [which was determined with reference to the printer state managed table at the following step 160] a printing demand.

[0056] When the judgment of Step 160 is affirmed, the print-data transfer request for a state requiring a transfer of the print data to the "waiting" printer 16 in Step 162 is transmitted to a workstation 14. In addition, when two or more "waiting" printers 16 exist [a state], a print-data transfer request is transmitted so that print data may be transmitted to any one printer. Thereby, print data are transmitted for a state to the "waiting" printer 16 from a workstation 14. At the following step 164, while registering

with a printing managed table by making the printing demand from a workstation 14 into "under printing", the state of a printer 16 where a printer state managed table corresponds is changed "during printing" from "it is waiting", and it returns to Step 100.

[0057] On the other hand, when the judgment of Step 160 is denied, in Step 166, a printing demand is registered into the printing queue of all the printers 16 for [aforementioned] a printing demand among the printing queues of each printer 16 formed in printing management equipment 18. At the following step 168, it registers with a printing managed table by making the printing demand from a workstation 14 into a "printing waiting state", and returns to Step 100.

[0058] Moreover, after changing the state of a printing demand of corresponding on a printing managed table at Step 122, to a printing end when it is judged that the message which received is the notice of a printing end from a printer (when the judgment of Step 120 is affirmed), at the following step 170, the ejection of a printing demand is carried out from the printing queue of the printer 16 transmitted the notice of a printing end. At Step 172, it judges whether the printing demand was registered into the printing queue. When it succeeds in the ejection of a printing demand at Step 170, the judgment of Step 172 is affirmed, and it shifts to Step 174. At Step 174, it judges whether the state of the taken-out printing demand is in "the waiting state waiting for printing" with reference to a printing managed table.

[0059] When the state of the taken-out printing demand "is printing", the judgment of Step 174 is denied and it returns to Step 170. [whether the judgment of Step 174 is affirmed by taking out a printing demand of a "printing waiting state", and] Or Steps 170-174 are repeated until the judgment of Step 172 is denied by losing the printing demand registered into the printing queue, and the ejection of a printing demand going wrong at Step 170. When the judgment of Step 172 is denied, the state of the printer on a printer state managed table is changed into "it is waiting" at Step 176, and it returns to Step 100.

[0060] Moreover, when the judgment of Step 174 is affirmed, while changing the state of the printing demand on a printing managed table "during printing" at Step 178, the state of the printer on a printer state managed table is changed "during printing." At the following step 180, a print-data transfer request is transmitted to a workstation 14 so that the print data corresponding to the printing demand taken out the account of before to the printer 16 may be transmitted, and it returns to Step 100.

[0061] Next, an operation of the printer control section 22 is explained with reference to the flow chart of drawing 12 . In addition, the messages which a printer 16 receives in the **** 3 example are only the print data from a workstation 14. If a message is received, the judgment of Step 190 will be affirmed, and it judges whether the messages which received at Step 192 are the print data from a workstation 14. it processes in any way noting that the message which is not possible is received, when the judgment of Step 192 is denied -- and it returns to Step 190 On the other hand, when the judgment of Step 192 is affirmed, after performing printing processing at Step 194 using the print data which received and completing printing processing, the notice of a printing end is transmitted to printing management equipment 18 at Step 196, and processing is ended.

[0062] Next, the processing sequence of the print system 10 of **** 3 example is further explained with reference to drawing 13 . If the printing demand from a workstation 14 is received, with printing management equipment 18, the printer for printing demand transmission will be judged and it will judge whether an waiting printer is in all the printers for printing demand transmission. Here, it carries out to all of the printers 16A, 16B, and 16C for printing demand transmission being under printing. In this case, while registering a printing demand into the printing queue of each printer, a printing demand is registered into a printing managed table as a printing waiting state.

[0063] If printer 16A will be in the state which can be printed, in printer 16A, the notice of a printing end will be transmitted to printing management equipment 18. Printers 16B and 16C will also be in the state which can be printed one by one after that, and the notice of a printing end will be transmitted. If the notice of a printing end is received, with printing management equipment 18, a printing demand will be taken out from the printing queue of the printer which transmitted the notice of a printing end, and the printing processing to this printing demand judges whether it is a printing waiting state. When the printing processing to the taken-out printing demand is in the waiting state waiting for printing (drawing 13 printer 16A), printing management equipment 18 transmits a print-data transfer request to a workstation 14, and makes print data transmit to printer 16A. Thereby by printer 16A, printing processing is performed by the transmitted print data. Moreover, when the printing processing to the taken-out printing demand is a state during printing (drawing 13 printers 16B and 16C), a print-data transfer request is not transmitted.

[0064] In addition, although printing management equipment 18 and printer 16A, and 16B-- explained to the example above the print system of a gestalt respectively connected to the transmission medium 12, it is also possible to apply this invention to the print system of a gestalt by which this invention is not limited to this, printer 16A and 16B-- are connected to printing management equipment 18, and only

printing management equipment 18 was connected to the transmission medium 12.

[0065]

[Effect of the Invention] The print system applied to invention according to claim 1 as explained above When a printing demand is received in each of two or more printers, this printing demand is registered into a printing queue. When a printer changes into the state which can be printed, a printing demand is taken out from a printing queue and it refers for the propriety of execution of printing processing. with printing management equipment When a printing demand is inputted to the group of a printer, while transmitting this printing demand to a printer respectively, a storage means is made to memorize by making printing processing to this printing demand into a non-running state. When it refers for the propriety of the execution of printing processing to a predetermined printing demand from a predetermined printer It changes, while performing the state of the aforementioned printing processing memorized by the storage means while transmitting print data to the aforementioned printer and making printing processing perform, when having not performed the aforementioned printing processing. Since execution of the aforementioned printing processing by the aforementioned printer was forbidden while the aforementioned printing processing was performing, when the load of printing management equipment is reduced and failure occurs to a printer, the outstanding effect of it becoming unnecessary to make complicated exception handling perform is acquired.

[0066] The print system concerning invention according to claim 2 It notifies, when a printer changes into the state which can be printed in each of two or more printers. When a printing demand is inputted to the group of a printer with printing management equipment, while registering with the printing queue in which this printing demand was respectively prepared corresponding to each printer, a storage means is made to memorize by making printing processing to the aforementioned printing demand into a non-running state. When a predetermined printer changes into the state which can be printed, a printing demand is taken out from the printing queue corresponding to the aforementioned printer. It changes, while performing the state of the aforementioned printing processing memorized by the storage means while transmitting print data to the aforementioned printer and making printing processing perform, when having not performed printing processing to the taken-out printing demand. Since execution of the aforementioned printing processing by the aforementioned printer was forbidden while the aforementioned printing processing was performing, when the load of printing management equipment is reduced and failure occurs to a printer, the outstanding effect of it becoming unnecessary to make complicated exception handling perform is acquired.

[0067] When a printing demand is inputted to the group of a printer, while registering the printing management equipment concerning invention according to claim 4 into the printing queue in which this printing demand was respectively prepared corresponding to each printer, carry out as a non-running state and a storage means is made to memorize the printing processing to the aforementioned printing demand. When a predetermined printer changes into the state which can be printed, a printing demand is taken out from the printing queue corresponding to the aforementioned printer. It changes, while performing the state of the aforementioned printing processing memorized by the storage means while transmitting print data to the aforementioned printer and making printing processing perform, when having not performed printing processing to the taken-out printing demand. Since execution of the aforementioned printing processing by the aforementioned printer was forbidden while the aforementioned printing processing was performing The outstanding effect that printing processing to a printing demand can be performed for a short time is acquired without performing complicated exception handling, when a load becomes excessive or failure occurs to a printer.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the outline block diagram of the print system concerning this example.
[Drawing 2] It is the block diagram showing the outline composition of the printing management equipment concerning the 1st example, and a printer.
[Drawing 3] The composition of a description in case a message is a printing demand, and (C of the composition of the message by which (A) is transmitted and received by the print system, and (B)) are conceptual diagrams in which a message shows the composition of the description in printing propriety reference etc.
[Drawing 4] It is a flow chart explaining an operation of the printing management equipment of the 1st example.
[Drawing 5] It is a flow chart explaining an operation of the printer control section of the 1st example.
[Drawing 6] It is the communication sequence diagram of the 1st example.
[Drawing 7] It is the block diagram showing the outline composition of the printing management equipment concerning the 2nd example, and a printer.
[Drawing 8] It is a flow chart explaining an operation of the printing management equipment of the 2nd example.
[Drawing 9] It is a flow chart explaining an operation of the printer control section of the 2nd example.
[Drawing 10] It is the communication sequence diagram of the 2nd example.
[Drawing 11] It is a flow chart explaining an operation of the printing management equipment of the 3rd example.
[Drawing 12] It is a flow chart explaining an operation of the printer control section of the 3rd example.
[Drawing 13] It is the communication sequence diagram of the 3rd example.
[Description of Notations]
10 Print System
16 Printer
18 Printing Management Equipment
22 Printer Control Section

[Translation done.]